

RESULTS FROM THE CHAMACOS STUDY OF CHILDREN'S ENVIRONMENTAL HEALTH

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Background and Aims: Organophosphate (OP) pesticides are acute neurotoxicants. In the US, they are widely used in agriculture. We present the associations of OP exposure during pregnancy and neurodevelopment of children in the CHAMACOS study, a longitudinal birth cohort study of primarily Latino farmworker families living in California.

Methods: We enrolled 601 pregnant women during pregnancy and conducted neurodevelopmental assessments of their children at 1 and 6 months and 1, 2, 3.5, 5, 7, and 9 years. The children are currently undergoing the 10.5 year assessment. OP pesticide exposure in the mother during pregnancy and of the children were assessed by measures of urinary dialkyl phosphate metabolites (DAPs). We also examined the association and effect modification of PON1 genotype and phenotype.

Results: We found that DAP metabolites of the mother during pregnancy are related to abnormal reflexes in the neonate on the Brazelton Scale, lower mental development on the Bayley Scales and pervasive developmental disorder as reported by their mother at age 2, and lower verbal abilities at 3.5 and 5 years. When the children reached school age, we reported an association between maternal DAPs and poorer attention as reported by the mother and as measured on a continuous performance test. In addition, by age 7 years, we found that there is a significant negative relation between all subscales of the WISC IQ and maternal DAP levels but not child levels. We will also present on results with autonomic nervous system reactivity and with PON1 genotype and phenotype.

Conclusions: We have found significant associations between OP exposure as measured by DAPs and child neurobehavioral development in a population living in an agricultural community. Maternal urinary DAP concentrations were higher, but nonetheless within the range of levels measured in the general U.S. population.